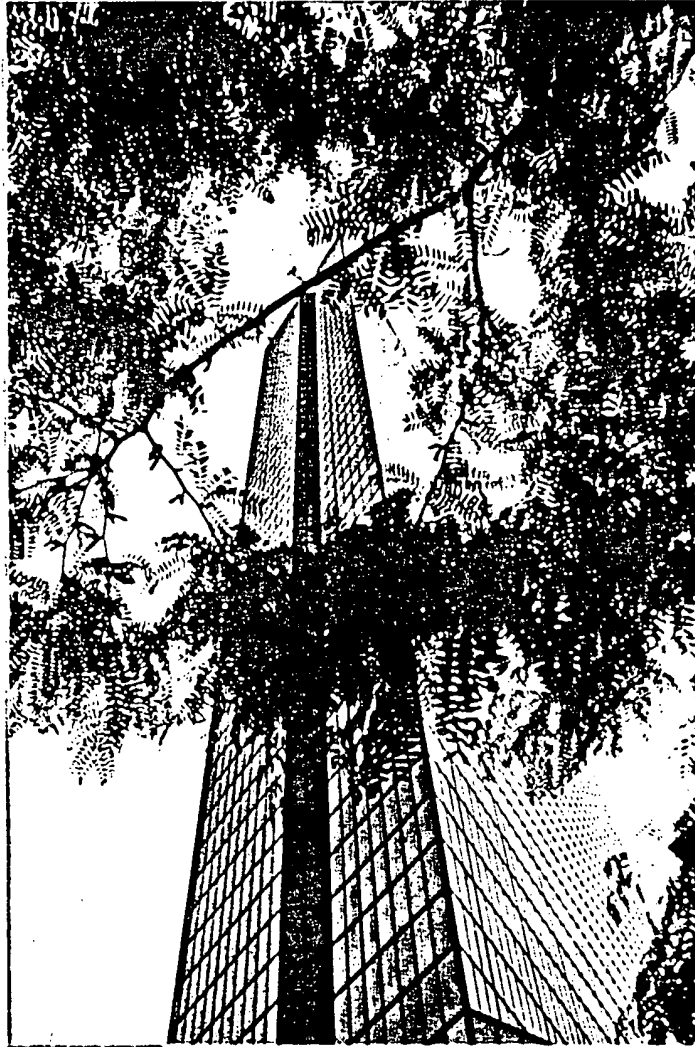




THE PROOF IN FIREPROOFING



UNITED STATES MINERAL



PRODUCTS COMPANY



PP/PRODUCT PRESENTATION

CAFCO® ...
The Proof in Fireproofing

CAFCO® Fireproofing Products are designed to meet the rigid standards that architects, owners and contractors require. No other products offer the same combination of features for dependability, versatility and safety:

- All CAFCO products contain no vermiculite and are absolutely asbestos-free
- Provide excellent fire resistant performance
- Offer a high level of physical performance properties
- Feature low-cost, fast spray application
- Eliminate most scaffolding requirements and leave no slippery overspray on floors
- Add the benefits of thermal insulation and acoustical control
- Are fully tested and classified for use in a broad range of construction combinations

Licensed CAFCO contractors are selected by USM on the basis of their qualifications and ability to work with our products toward the goal of providing solutions to construction problems. USM offers training and field support to this network of skilled contractors.

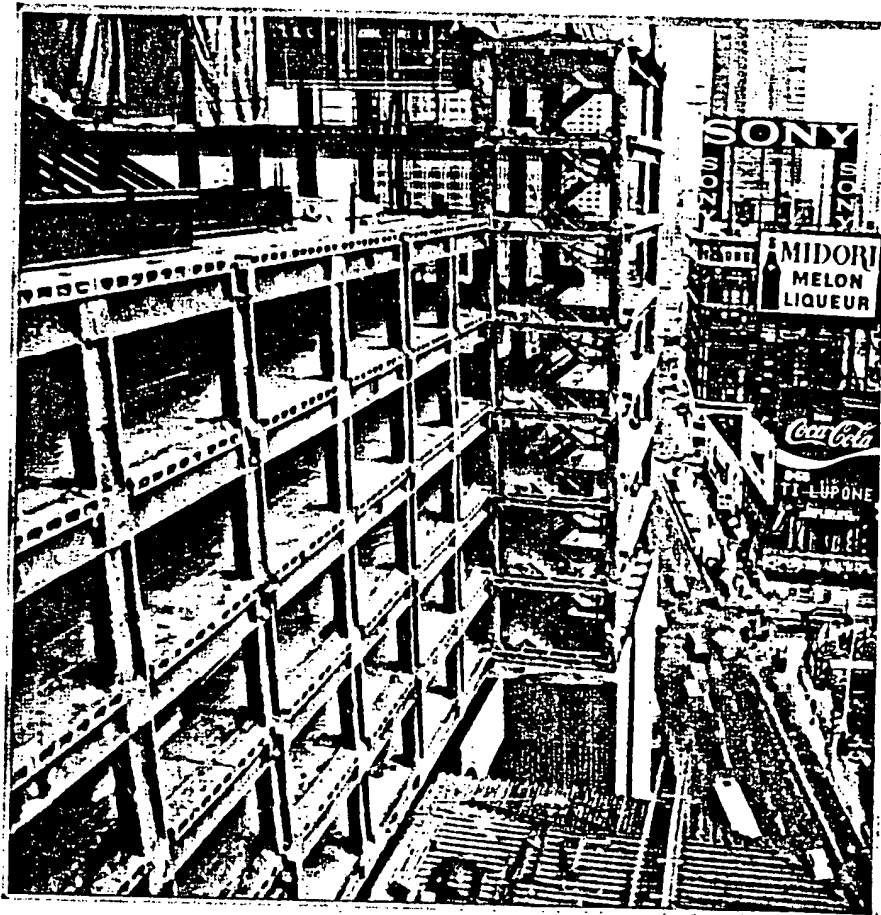
Our Technical Staff provides detailed specifications, product selection recommendations and other technical support to architects and contractors. USM's Sales Force is well trained and capable of offering technical assistance.

This combination of safe, dependable and economical product installed by trained, licensed contractors and supported by a knowledgeable sales and technical team results in the assurance of consistent, high quality fireproofing applications.

This is why CAFCO is the most widely used and specified absolutely asbestos-free sprayed fireproofing in America and why CAFCO is THE PROOF IN FIREPROOFING.

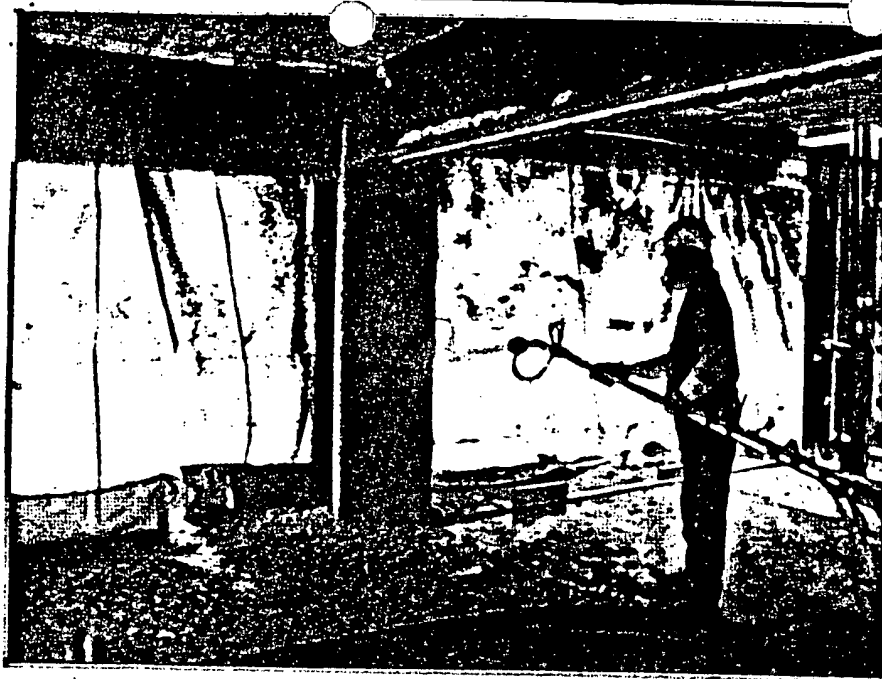
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**DT/DOCUMENT**

This catalog contains general and technical information describing spray applied CAFCO products for structural fireproofing. This data is provided to help designers and contractors satisfy their needs for quality products in these areas.

7.14/Uns



Health and Safety

CAFCO BLAZE-SHIELD and CAFCO DECK-SHIELD are among the safest products available for use in construction today.

USM certifies that all CAFCO products contain absolutely NO asbestos fibers, NO asbestos-contaminated vermiculite and are NOT subject to asbestos contamination during manufacture. This certification is supported by independent laboratory analysis, which utilized the latest and most sophisticated asbestos detection techniques, including transmission electron microscopy (to a magnification of 15,000X). The report of this analysis concluded "asbestos is absent in this product." (This report is available upon request.) Not all manufacturers can provide such a certification with comparable laboratory results.

This is important because the regulations of EPA and OSHA do not prohibit the presence of asbestos in sprayed fireproofing and insulation materials. The current regulations merely control that amount of asbestos which can be present in products or to which workmen can be exposed during the application of these products.

Because some products which are formulated without asbestos can be produced with asbestos-contaminated raw materials and still comply with the current federal regulations, it is important to understand that CAFCO fireproofing products are absolutely free of asbestos.

The application of CAFCO materials is performed with electrically powered pneumatic spraying equipment. This alleviates any concern for fumes typically experienced when installing products with gasoline- or diesel-powered equipment. Most applications are performed from the floor eliminating the potential hazards of scaffolding. Furthermore, the sprayed fiber composition of CAFCO is such that overspray on the floors is minimal and not slippery.

**FIRE TEST PERFORMANCE,
PHYSICAL PERFORMANCE,
SAFETY, VERSATILITY AND
ECONOMY MAKE CAFCO®
PRODUCTS THE LOGICAL
CHOICE IN FIREPROOFING.**

Physical Performance

While fire ratings are important, they are only one measure of performance for a fire protection material. Architects and owners should also expect a product application to endure other exposures during the construction cycle and throughout the building's life.

In recent years, ASTM developed test methods to approximate the various forces which act upon fireproofing materials in these exposures. These testing methods are nationally recognized as the acceptable means for determining:

- Bond Strength (Adhesion/Cohesion)
- Compressive Strength
- Deflection
- Bond Impact
- Air Erosion Resistance
- Corrosion Resistance

CAFCO BLAZE-SHIELD and DECK-SHIELD have been tested for these properties by independent laboratories. Owners, architects and contractors can have confidence in the high level of performance demonstrated by these test results for CAFCO products.

CAFCO's strength in all these tests is the result of an exclusive blend of mineral fibers and cementitious binders. The fibers interlock in a unique manner holding the fireproofing mat to the steel and to itself, further enhancing this inherent durability. This fiber network gives the applied product unusual strengths where vibration, excessive deflection and seismic occurrences are a concern.

OP/OVERALL PRODUCT

Fire Test Performance

CAFCO® Fireproofing Products: BLAZE-SHIELD® and DECK-SHIELD® (U.L.I. Designations "Type DC/F" and "Type C/F," respectively), have been tested for fire endurance by Underwriter's Laboratories, Inc., and Underwriter's Laboratories of Canada in accordance with ASTM E119 (UL 263, ULC S101). These tests have developed ratings of up to 4 hours for floor/ceiling, beam, column and roof/ceiling assemblies. A complete reference guide to designs utilizing CAFCO fireproofing products is available upon request.

Underwriter's Laboratories, Inc. lists the following Surface Burning Characteristics for BLAZE-SHIELD and DECK-SHIELD:

Flame Spread	10
Smoke Developed	0

CAFCO products have also been tested for structural fire protection at the following prominent fire testing stations:

- Fire Research Station—FIRTO—UK
- Centre Scientifique et Technique du Batiment—Paris, France
- Institut für Baustoffkunde und Stahlbetonbau—Braunschweig, West Germany



OP/OVERALL PRODUCT

Fireproofing With CAFCO®

CAFCO® produces and markets two high-quality sprayed fireproofing materials: BLAZE-SHIELD® and DECK-SHIELD® (U.L.I. Designations "Type DC/F" and "Type C/F," respectively). Both products are capable of providing excellent fire resistance to structural members and assemblies with safety, permanence and economy.

CAFCO BLAZE-SHIELD is best suited for application to floor-ceiling assemblies, utilizing fluted and cellular steel decks, with or without electrification; structural beams and columns; concrete assemblies and roof systems.

CAFCO DECK-SHIELD was originally formulated for application to semi-flexible roof systems. DECK-SHIELD can also be used for floor-ceiling assemblies with fluted decking; structural beams and columns and wall assemblies.

Consult USM's Technical Staff or your CAFCO Representative for assistance in product and design selection.

Features

- Designed for direct spray application to steel members, floor and roof decks, and wall assemblies
- One-coat application
- Added benefits of acoustical control and thermal insulation
- Fast, reliable, economical installation requiring minimal clean-up
- Absolutely asbestos-free

BLAZE-SHIELD and DECK-SHIELD have proven themselves to be highly effective, versatile and absolutely asbestos-free fireproofing materials. These high quality fire protection products are specially formulated of mineral fibers and cementitious binders for spray application to steel and concrete assemblies requiring fire endurance ratings.

In addition to providing high levels of fire protection, BLAZE-SHIELD and DECK-SHIELD offer excellent thermal and acoustical properties. These features often eliminate the need and expense of supplemental acoustical ceiling applications and additional insulation thickness on roofs protected with CAFCO fireproofing.

The safety aspects of CAFCO's fireproofing products are without equal. In addition to their absolutely asbestos-free formulations, BLAZE-SHIELD and DECK-SHIELD can be handled and used safely. The fast, economical application of CAFCO fireproofing is performed using electrically-powered, pneumatic spraying equipment. This eliminates the fumes and storage problems usually associated with fireproofing operations requiring gas- or diesel-powered equipment. Typical CAFCO applications can be accomplished without costly, and potentially hazardous scaffolding. And, overspray on the floors is minimal and not slippery. Clean up and removal can be carried out quickly, at any stage of the application.

BLAZE-SHIELD and DECK-SHIELD master the toughest fireproofing challenges by completely enveloping the members and assemblies to be rated with a strong, yet flexible, blanket of protection against fire and heat. Under typical end-use conditions, CAFCO fireproofing can be expected to remain in place and provide the required measure of fire protection for the life of the construction. The table of physical properties (on the next page) illustrates CAFCO's excellent performance characteristics when tested according to recognized standards to approximate the types of conditions against which fireproofing materials should be expected to perform.

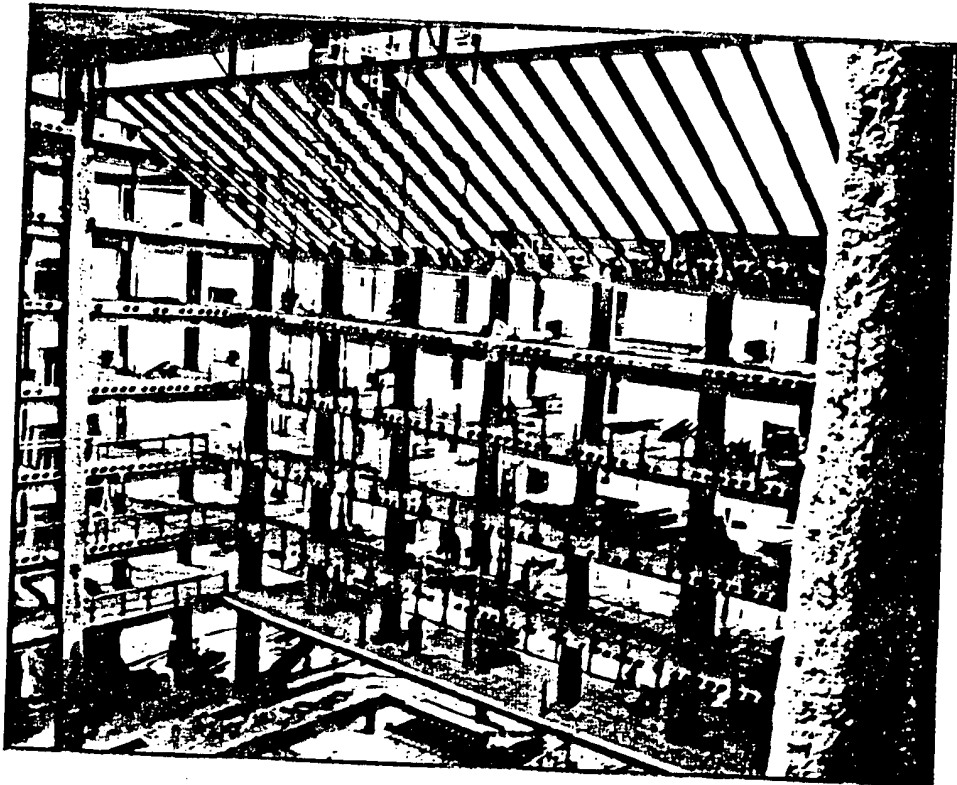


TABLE OF PHYSICAL PROPERTIES

Characteristic	ASTM Standard	Acceptable Performance**	Tested Performance
Cohesion/Adhesion	E736	100 p.s.f. (4.8 kPa)	over 100 p.s.f. (cover 4.8 kPa)
Deflection	E759	No Cracks or Delaminations	No Cracks or Delaminations
Bond Impact	E760	No Cracks or Delaminations	No Cracks or Delaminations
Compressive Strength	E761	500 p.s.f. (23.9 kPa)	over 500 p.s.f. (over 23.9 kPa)
Air Erosion	E859	Less than 0.025 grams/s.f. (less than 0.27 grams/m ²)	Less than 0.025 grams/s.f. (less than 0.27 grams/m ²)

**USM suggested performance levels based on nationally recognized standards. All values are the result of independent laboratory tests performed by International Testing Laboratories, Inc., Newark, New Jersey on BLAZE-SHIELD® and DECK-SHIELD®. Reports are available upon request.

7.14/Uns



Thermal Properties

Because of their mineral fiber based formulations, CAFCO® BLAZE-SHIELD® and DECK-SHIELD® are highly effective thermal insulators. This benefit is important to architects and engineers concerned with heat loss, particularly through roofs. The tested thermal performance of CAFCO fireproofing is as follows:

PRODUCT	CONDUCTIVITY (k)	RESISTANCE (R/inch)
BLAZE-SHIELD	.29 @ 75°F (0.042 W/mK @ 24°C)	3.45
DECK-SHIELD	.31 @ 75°F (0.045 W/mK @ 24°C)	3.23

Acoustical Performance

The mineral fiber formulations of CAFCO fireproofing products contribute acoustical correction in addition to fire resistance and thermal insulating properties. This benefit can add value to the application of CAFCO fireproofing in mechanical equipment rooms, parking garages, etc. Tests performed with BLAZE-SHIELD and DECK-SHIELD have yielded the following acoustical results:

PRODUCT	THICKNESS	BASE	NRC RATING
BLAZE-SHIELD	½ inch (13mm)	Deck & Beam	.85
BLAZE-SHIELD	¾ inch (19mm)	Solid	.65
DECK-SHIELD	¾ inch (19mm)	Solid	.75

CC/CODES, CERTIFICATIONS

Code Compliances

CAFCO fireproofing products satisfy the requirements of the following building code organizations:

- SBCCI—Southern Building Code Congress International (Report No. 8441)
- ICBO—International Conference of Building Officials (Report No. 1244)
- BOCA—Building Officials and Code Administrators International

Major Specifications

BLAZE-SHIELD and DECK-SHIELD also comply with the requirements of the following specifications:

- U.S. Government Federal Specification: SS-S-111B
- General Services Administration (GSA): PBS-4-09200
- U.S. Environmental Protection Agency (EPA): Regulation 40 C.F.R. Chapter 1, Subsection 61.22E
- Veterans Administration (VA): H-08-1









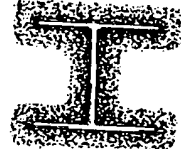
Consult individual code compliance listings for required thicknesses, densities, etc., or contact your CAFCO representative for details.



UA/USES, APPLICATIONS

Typical Fire Resistance Ratings

The following table lists U.L. designs* which classify CAFCO® fireproofing for many typical construction combinations. These are the most commonly used listings. Our technical staff and representatives can assist you in determining suitable designs for your project.

SYSTEM OR COMPONENT	RATING(HR.)	U.L. DESIGN	DESIGN DETAILS
Protected Floor Assemblies	2,3 1,1½,2 1,1½,2,3,4 1,1½,2,3 2 2	D832 D847 D858 D859 D861 F816**	 
Unprotected Floor Assemblies	2 1,1½,2,3 1½,2,3	D840 D902 D904	 
Beams	1,2,3,4 1,1½,2,3 1,1½,2,3,4	N805 N815 N816	
Roof Assemblies (with board insulation)	1,1½,2 1,1½ 1 1,1½,2 1,1½,2	P801 P803 P814 P815 P816	 
Roof Assemblies (with insulating concrete)	1½,2 1½,2 1½,2 1,1½,2	P902 P908 P920 P922	
Columns W6x16 or larger W8x28 or larger W10x49 or larger W14x228 or larger	1,1½,2,3 2,3,4 2,3,4 2,3,4	X821 X822/X525 X818/X801 X807	

* In all cases, consult the actual design listing for beam sizes, deck profiles, electrification details, roof coverings and other construction details.
** Refers to Underwriters Laboratories of Canada List of Equipment and Materials.

TS/TECHNICAL SUPPORT

Guide Specification

1.0 SCOPE

1.1 Work Included

Provide all labor, materials and equipment necessary for and incidental to the complete and proper installation of all sprayed fireproofing and related work as shown on the drawings, or where specified herein, and in accordance with all applicable requirements of the Contract Documents.

- 1.2 The material and installation shall conform to the applicable building code requirements of all authorities having jurisdiction.

2.0 PRODUCTS

- 2.1 The sprayed fireproofing materials shall be asbestos free CAFCO® BLAZE-SHIELD® or CAFCO DECK-SHIELD® (U.L. Designations "Type DC/F" or "Type C/F," respectively), as manufactured by United States Mineral Products Company (marketed abroad by CAFCO International Limited). Materials shall be free of all forms of asbestos and asbestos contamination, and manufacturer shall provide certification of same, signed by an officer, upon request.

- 2.2 Materials shall be delivered to the project site in manufacturer's unopened packages, fully identified as to trade name, type, grade, or other identifying data, and bearing the U.L. label, where required. The material shall be stored off the ground and under cover, and in a location which shall be protected from the weather.

- 2.3 Potable water shall be used for the application of sprayed fireproofing materials.

3.0 STANDARDS OF PERFORMANCE

- 3.1 The sprayed fireproofing materials shall have been tested and reported by Underwriters Laboratories, Inc., or Underwriter's Laboratories of Canada (ULC) in accordance with the procedures of ASTM E119.
- 3.2 Materials shall meet the requirements of Federal Specification SS-S-111B, Type II, factory mixed mineral fibers with integral inorganic binders, except as modified herein, and having the following characteristics:
- 3.3 *Deflection*: when tested in accordance with ASTM E759, the material shall not crack or delaminate from the surface to which it was applied.
- 3.4 *Bond Impact*: when tested in accordance with ASTM E760, the material shall not crack or delaminate from the surface to which it was applied.

- 3.5 *Adhesion/Cohesion (bond strength)*: when tested in accordance with ASTM E736, the material applied over uncoated or galvanized steel shall have a minimum average bond strength of 100 lbs./sq. ft. (4.8 kPa).

- 3.6 *Air Erosion*: when tested in accordance with ASTM E859, the material shall not be subject to losses from the finished application greater than 0.025g/ft.² (0.269g/m²).

- 3.7 *Compressive Strength*: when tested in accordance with ASTM E761, the material shall not deform more than 10 percent when subjected to a crushing force of 500 lbs./sq. ft. (23.9 kPa).

- 3.8 *Corrosion Resistance*: bare, shop-coated and galvanized steel sheets with applied fireproofing shall be tested in accordance with ASTM E937.

- 3.9 *Non-Combustibility*: when tested in accordance with ASTM E136-73, material shall be non-combustible.

- 3.10 *Surface Burning Characteristics*: when tested in accordance with ASTM E84 (tunnel test), the material shall exhibit the following surface burning characteristics:
FLAME SPREAD 10
SMOKE DEVELOPED 0

- 3.11 *Density*: when tested in accordance with ASTM E605, the material shall meet the minimum individual and average density values as listed in the appropriate U.L. design, or as required by the authority having jurisdiction.

- 3.12 The sprayed fireproofing shall be installed at the required thickness and density to achieve the following ratings:
- | | |
|----------------|-----------|
| Floor Assembly | _____hr. |
| Roof Assembly | _____hr. |
| Beams | 2_____hr. |
| Girders | 2_____hr. |
| Columns | 2_____hr. |

4.0 PREPARATION

- 4.1 All surfaces to receive sprayed fireproofing shall be free of oil, mill scale, dirt, grime, grease, dust, loose rust, paint or other foreign materials which would impair satisfactory bonding to the surface. Any cleaning required shall be accomplished just prior to the application of the sprayed fireproofing.

- 4.2 Clips, hangers, supports, sleeves and other attachments to the substrate are to be placed by others, prior to the application of sprayed fireproofing.

- 4.3 The installation of ducts, piping, conduit or other suspended equipment shall not take place until the application of sprayed fireproofing is complete in an area.

- 4.4 The application of sprayed fireproofing shall not commence until certification has been received by the General Contractor indicating that surfaces to receive sprayed fireproofing have been inspected by the applicator and are acceptable to receive sprayed fireproofing.

5.0 APPLICATION

- 5.1 Equipment, mixing and application shall be in accordance with the manufacturer's written application instructions, and the materials shall be installed by a firm licensed or otherwise approved to apply the material by the manufacturer.

- 5.2 Sprayed fireproofing shall not be applied to steel floor decks prior to the completion of concrete work on that floor.

- 5.3 The application of sprayed fireproofing to the underside of roof deck assemblies shall not commence until after the completion of roofing applications and after roof traffic has ceased.

- 5.4 When the prevailing outdoor temperature at the building is less than 40°F (4°C), interior substrate temperature of 40°F (4°C) shall be maintained for 24 hours before, during and 24 hours after application of sprayed fireproofing. If necessary for job progress, provide enclosures with heat to maintain temperatures.

- 5.5 Provisions shall be made for natural ventilation to properly dry the sprayed fireproofing after it has been applied.

- 5.6 All patching of and repair to sprayed fireproofing, due to damage by other trades shall be executed under this section and paid for by the trade responsible for the damage.

6.0 CLEAN UP

- 6.1 After the completion of the work of this section in any area, application equipment shall be removed from floors, and other surfaces not to be sprayed shall be cleaned of all deposits of fireproofing material. All floor areas shall be sufficiently broom-cleaned.

7.0 INSPECTION AND TESTING

- 7.1 The sprayed fireproofing shall be tested for thickness and density in accordance with one of the following procedures:

- 7.1.1 ASTM E605: "Standard Test Method for Thickness of Sprayed Fire Resistive Material Applied to Structural Members."

- 7.1.2 AWSI: "Inspection Procedure for Field-Applied Sprayed Fire Protection Materials."

- 7.1.3 U.B.C. Standard No. 43-8: "Thickness and Density Determination for Spray-Applied Fireproofing."



Representative Installations

CAFCO® Fireproofing Products are the most widely used, absolutely asbestos-free sprayed fireproofing materials in America.

Many prominent steel frame structures are protected with CAFCO materials. The 60 story John Hancock Office Tower in Boston (shown on the cover) gives testimony to the merits of CAFCO products. Chosen by the owner and architect to provide the safest and healthiest work environment to the employees of John Hancock, the installation of CAFCO Fireproofing (performed in 1971-72) has answered the need for safe, dependable fire protection and has been virtually maintenance free.

From coast to coast and around the world, on thousands of large buildings and small, CAFCO is providing the safety, durability and versatility that the construction industry has come to expect from all CAFCO products.

A listing of prominent installations of CAFCO Fireproofing Products is available upon request from USM.

MR/MANUFACTURER

Since 1875, UNITED STATES MINERAL PRODUCTS COMPANY has been a pioneer in providing high caliber products to the construction industry.

Our commitment to providing products and systems which solve problems in the construction industry is the driving force behind extensive research and product development efforts. These efforts have produced a number of technological advances in product design, manufacturing processes and product applications which set USM products and systems apart from those of competitive materials.

The manufacturing and marketing accomplishments of USM's Mineral Fiber Technology Group have resulted in an extensive line of products:

- CAFCO BLAZE-SHIELD® and CAFCO DECK-SHIELD®—spray applied fireproofing for commercial and institutional buildings,
- CAFCO HEAT-SHIELD®—spray applied thermal insulation for structures,
- CAFCO SOUNDCOTE™ and CAFCO SOUND-SHIELD®—sprayed acoustical treatments,
- CAFCO Curtain Wall Insulation, CAFCO Saling Insulation and CAFCO Sound Control Blankets—semi-rigid insulation boards,
- CAFCOTE® 560, CAFCOTE 800 and CAFCO DECK-SHIELD 460—spray applied fireproofing for industrial applications and other high abuse areas,
- CAFCO CERAMOSPRAY® Products—spray applied high temperature insulation for industrial equipment,
- USM Cryogenic Fiber—low temperature insulation,
- USM CeramaFiber® Pouring and Blowing Wool—products for residential insulation applications.

USM also distributes these products to specialized architectural and industrial markets worldwide through our subsidiary, CAFCO INTERNATIONAL LIMITED.

AC/AVAILABILITY, COST

Product Availability

CAFCO Fireproofing Products are available to over 600 USM licensed contractors in America and around the world from six strategically located production and distribution points in the U.S. and Europe and through licensed manufacturers in three foreign countries.

Our representatives are available through Sweet's BUYLINE, or by calling USM at (800) 631-9600, or (800) 562-0256 (in N.J.).

The performance data herein reflects USM's expectation based on tests conducted in accordance with recognized standard methods. The sale of these products shall be subject to the Terms and Conditions of Sale, including those limiting warranties, set forth in USM's invoices.

No agent, employee, or representative of USM or its subsidiary or affiliated companies is authorized to modify this disclaimer.

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